

STARVATION LONGEVITY OF *LOXOSCELES LAETA* (NICOLET) (ARANEAE)¹

D.C. Lowrie²

ABSTRACT: Data are reported on the longevity of *Loxosceles laeta* and its ability to withstand starvation and lack of water.

Anderson's (1974) comparison of the energetics and life styles of the spiders *Lycosa lenta* Hentz and *Filistata hibernalis* Hentz has demonstrated the importance of withstanding starvation for long periods in spiders. This report is on the longevity of *Loxosceles laeta* (Nicolet) and its ability to withstand starvation. Bonnet (1935, 1939) and the work of others cited in the Bibliographia Araneorum (Bonnet 1945) contain some data on longevity but only under normal conditions of feeding. My data should be important for physiologists who would test the relationship between longevity and ability to withstand physical stress such as starvation and lack of water. Also, it is important in understanding how these species withstand starvation episodes associated with accidental dispersion by humans.

Results and Discussion

The only good data I could find on starvation longevity in spiders is Anderson's (1974) on adult filistatids. They lived for a mean of 276 days without food. With food they have lived over eleven years (Bonnet 1945; Lowrie 1966). The *Loxosceles laeta* raised in this study lived under conditions of various amounts and some variety of food and were fed fairly regularly every several days. They were kept in either of two sizes of plastic vials (about 40 cm³ and 80 cm³) with tight snap caps. None of the spiders were given water and seldom, except during feeding, was the cap removed. They had very little water vapor in the vial as room humidity seldom exceeded 30%. They were kept at room temperature, ranging from 15°C to 20°C. During starvation there was no sign of stress as they remained plump and active until death. Field collections in Chile (Schenone et. al., 1970) indicate this spider is a common inhabitant of houses, seldom, if ever, being found in the field. Thus, except for the confinement within vials, the spiders were living under somewhat "natural" conditions.

The data reported here are on individuals raised from a single egg sac. Each of 48 spiderlings was placed in a separate dry vial after it emerged from the sac on 27 July 1970. By December 1973 10 immatures had died

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²Prof. Emeritus, California State University at Los Angeles.

but there were 38 adults still alive (22 males and 16 females). Until 26 December 1973 these spiders were fed mealworms (usually weekly) and about ten meals of other insects. By this time they were over three years old and were adults. From then until 22 July 1976 they were partially starved, being fed one mealworm each on four occasions at long intervals (ranging from three to ten months). Since 22 June 1976 until the last female died on 17 July 1978, a maximum of 755 days, the fourteen females that were then alive had survived an average of 453 days (1.24 years) more without food (Table 1).

TABLE 1: Life cycle data on *Loxosceles laeta* fed on a varied diet.

	Days to Adulthood		Days as Adult		Total Days of Life		No. Days of Starvation
	F	M	F	M	F	M	F
Sex							
No. Specimens	16	22	16	22	16	22	14
Mean	762	818	1745	598	2507	1417	453
S.D.	104	194	327	197	300	97	171
Range of means by t test (95% Level)	707- 818	733- 905	1571- 1919	511- 685	2348- 2667	1374- 1460	354- 551
Actual Range of Individuals	669- 973	547- 1200	1028- 2108	227- 912	1746- 2872	1101- 1494	219- 755

These females took an average of 762 days (2.1 years) to reach maturity and lived an average of 1745 days (4.8 years) as adults under conditions of partial food deprivations. The males averaged 818 days (2.2 years) to maturity but only lived 598 days (1.6 years) as adults and were all dead when the period of total starvation began. These data on days to maturity do not agree with those of Galiano (1967). Her data, based upon 51 females and 75 males, indicate a mean of 406.5 days for males while females averaged 315.3 days to reach maturity. Her spiders took about half the time to reach maturity of the ones I raised. This may be due to several factors: the feeding regime, sample size, or a more uniform genetics with a slower growth rate of my one egg-sac sample.

These data indicate that this species is capable of prolonged life with little food and no free water. These conclusions probably apply also to other species in the genus. One specimen of *Loxosceles deserta* Gertsch, collected by Wendell Icenogle in the El Paso Mountains of Southern California in 1969 and raised by me, lived under the same conditions after

capture and survived until 25 July 1977. The ability of *Loxosceles laeta* to withstand long periods without water or food certainly helps to explain its wide dispersal. It has been found in Helsinki, Finland; Vancouver and Toronto, Canada; Boston and the Los Angeles area, in the United States (Gertsch 1967; Huhta 1972; Keh 1970; Levi and Spielman 1964), as well as ranging widely in South America (Gertsch 1967).

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